

nition as a service to science as many more showy performances.

Several very large Wimshurst electrical machines (including one of 160 plates!), in which the oppositely rotating plates are specially mounted so as to run truly and smoothly, were made in the workshop, and greatly increased the experimental resources available for X-ray work and the investigation of the phenomena of electrical discharge.

Lord Blythwood himself came very near to the discovery of the X-rays, for he had obtained photographic action through various opaque substances before Röntgen made his memorable announcement. Since that time much work has been done in the Blythwood laboratory on this subject. With the skilful help of Mr. H. S. Allen, and more lately of Mr. Walter Scoble, Lord Blythwood carried out many interesting researches on spectrum photography and the Zeeman effect, in radiography, and in radio-activity generally.

During the last year or so Lord Blythwood and Mr. Scoble had been engaged in experiments in flight. In the course of these they designed an air-engine for a model aeroplane, which gave more than one-half of a horse-power and weighed only two pounds! The air for driving this engine was stored in the liquid form, so as to keep down the weight of the containing vessel.

At the end of a long and active life, Lord Blythwood has passed away, leaving a fine record behind him of good work done and notable results obtained. If his example should lead other men of means and leisure to follow in the same path, then in a more than usual but very real and true sense his work will follow him.

A. GRAY.

#### THE NATURAL HISTORY MUSEUM.

TEN years ago, upon the retirement of Sir William Flower from the post of director of the Natural History Museum, a memorial signed by many distinguished men of science (see *NATURE*, July 14, 1898) was presented to the trustees of the British Museum urging that it is "of great importance to the welfare of natural history that the principal official in charge of the national collections relating to this subject should not be subordinate in authority to any other officer of the Museum." The recent retirement of Sir Ray Lankester has again provided an opportunity for pressing the adoption of this principle, and a strong deputation waited upon the Prime Minister on Tuesday to ask for an inquiry into the administration of the Museum. From the *Times* report we extract the following account of the interview:—

Prof. Adam Sedgwick, F.R.S., said the objections to the present administration of the Natural History Museum had reference to a system, and not to individuals. For many years the condition of the Natural History Museum and its mode of government had been a standing grievance to naturalists, and many endeavours had been made to obtain a separate government for it. The reasons of the deputation for asking for an inquiry could not be better expressed than by summarising the history of the principal attempts which have been made to bring about a change in the methods of administration of the museum. Forty-two years ago the most distinguished men of science of the day, in a memorial to the Government, expressed the opinion that "it is of fundamental importance to the progress of the natural sciences in this country that the administration of the national natural history collections should be separated from that of the library and art collections." Thirty-five years ago a Royal Commission, in pressing the same points, directed attention to the statements of witnesses that it was "unsatisfactory that the national collection should be managed by a body of gentle-

men whose time is in most cases fully occupied by other important duties, and the majority of whom are not selected with reference to any special qualifications for such a post." Twenty-nine years ago the council of the British Association for the Advancement of Science endorsed these recommendations both of the Royal Commission and of the leading naturalists of the day, and strongly urged upon the Government the importance of giving effect to them. Ten years ago a representative body of scientific men presented a memorial to the trustees, in which it was urged that the principal official in charge of the national collections relating to natural history should not be subordinate in authority to any other officer of the museum. The present deputation also felt that the method of administration of this great national institution, which had not only been an important means of scientific research and an example to other nations, but had given the highest instruction and purest delight to hundreds of thousands of persons was in matters of vital importance seriously defective. They were there to ask for a full official inquiry into the organisation and administration of the Natural History Museum, with the view of a reasonable treatment of the matter in the immediate future by the Government.

Speeches in support of the views above expressed were made also by Mr. Francis Darwin, F.R.S., Prof. G. C. Bourne, and others.

In reply, Mr. Asquith pointed out that, as regards the administration of the museum, the trustees are a superior body with whom the Government are powerless to interfere. The arguments advanced by the deputation as to the management by the trustees apply equally to the Bloomsbury Museum. The trustees, men of wide experience and great discretion, are equally cognisant of natural history and archæology. The trustees are about to appoint a keeper of zoology, and it is not intended to abolish the directorship, but only to wait to ascertain who is the best man for the responsible position. He sympathised with the view that the director should have a free hand in the management of his department, and promised to convey to his fellow-trustees of the British Museum all that the deputation suggested.

#### NOTES.

WE regret to see the announcement of the death, on July 27, of Sir Thomas Stevenson at seventy years of age. Sir Thomas was appointed senior scientific analyst to the Home Office in 1881, and was knighted in 1904. He was past-president of the Society of Medical Officers of Health, the Society of Public Analysts, and the Institute of Chemistry. He was also the author and editor of various memoirs on forensic medicine.

THE death is announced, at sixty-seven years of age, of the engineer René Panhard, whose name is well known in connection with the development of the motor-car. We also notice the announcement of the death of Prof. Daguille, assistant professor of botany at the Sorbonne, Paris, and author of a number of books upon botanical science.

THE German Kepler Society has founded a prize of 50*l.* to encourage research on the early traces of life (pre-Silurian) and their relation to the theory of evolution.

At the congress of historical sciences to be held in Berlin on August 6–12, there will be a section concerned with the history of science. Among communications to be dealt with in this section are, we learn from the *Revue scientifique*, the work of Avogadro from the point of view of chemical theory, by Prof. Guareschi, of the University of Turin; the history of the development of physical chemistry, by Prof. Gerland, of Clausthal School of Mines; Arab contributions to the progress of science, by Prof. Wiederman; and on Boyle's law, by M. F. Mentré.

AMONG other prizes offered for scientific researches in Italy, we note a gold medal, of value 40*l.*, offered for the

best essay on "galvanism" (*i.e.* animal electricity) by the Bologna Academy, the last date of entry being May 26, 1909; and one of 20*l.* for the best work on the mineralogy of Vesuvius, offered by the Naples Academy, for which essays have to be sent in not later than June 30, 1909. In either case the essays may be in Latin, French, or Italian, and must be sent in under a *nom de plume*, the author's name being enclosed in a sealed envelope.

THE Italian Geographical Society (Rome, 102 Via del Plebiscito) offers a prize of 200*l.* for the best original work by an Italian author on economic geography, *i.e.* geography studied in its relations with commerce, emigration, and colonisation, with special reference to Italian economic requirements.

MR. W. T. LYNN has kindly sent us the following answer to the inquiry of a correspondent as to why June 24 is called Midsummer Day:—"Our ancestors decided that the quarter-days should be the sacred or holy days nearest to the four astronomical quarters, that is, the two solstices and the two equinoxes. So the four quarter-days are March 25 (Lady Day), June 24 (St. John the Baptist's Day), September 29 (St. Michael and All Angels' Day), and December 25 (Christmas Day). As the June quarter (St. John the Baptist's Day) was so near Midsummer, it acquired the name of Midsummer Day. If it be further asked why June 24 was St. John the Baptist's Day, it is that it means the day of his birth, and it would appear from Luke i. 26 that this was a little more than six months before that of Christ, so it is taken as six months and one day before Christmas day."

MR. C. KENRICK GIBBONS has presented to the Zoological Gardens a large number of the small fresh-water fish from Barbados known as "millions" (*Girardinus poecilloides*). These little fish, which have been placed in a tank in the tortoise house, are of special interest because of their supposed action in preventing malaria. Malaria is very much less common in Barbados than in other West Indian Islands, and it has been suggested that this freedom is due to the presence of enormous quantities of the "millions" in the fresh-water pools. The little fish are very voracious, and destroy large numbers of the larvæ of mosquitoes that spread malaria. The males are about half an inch long, with brilliant iridescent colours, and large black spots on the sides. The females are considerably larger and less highly coloured. It is understood that experiments are going to be made with the introduction of these fish into tropical countries where malaria is prevalent.

At a meeting of the British Academy, held on July 22, Prof. R. S. Conway reported the results of his tour in Austria and the north of Italy, undertaken with the aid of the academy in order to collect inscriptional and other material for the study of the ethnological questions which he indicated at a meeting of the academy in May, 1907. From the report in the *Times*, we learn that Prof. Conway said he has revised and made many corrections in the text of nearly all the inscriptions previously known (about eighty-eight in number), leaving only six or seven which proved inaccessible within the limits of time at his disposal. Of the eighty-eight, three are Etruscan, and ten belong to a problematic group which it is convenient to call Rhaetic, found mostly in the region of the Brenner Pass, both north and south of it. To this group are added eight hitherto unpublished; but nothing definite can at present be said as to their language or languages. On the ethnological questions, Prof. Conway reported that none of the

Venetian inscriptions is older than 500 B.C., and that they were certainly written by a community which shared the Villanova culture, which first appeared in Este, as in Bologna, according to the accepted dating, in the eleventh or tenth century B.C. It remains, therefore, still to be determined whether, as Strabo thought, they were identical with the Veneti of Gaul, and so brought the language with them into Italy, or whether they merely learned the language from the people on the soil when they arrived.

ACCORDING to the report for 1907, the Rhodesian Museum at Bulawayo continues to make satisfactory progress, although its expansion is somewhat hindered by lack of sufficient funds. The curator contributes a list of the local mammals in the collection.

THE ticks (Ixodoidea) of the United States are reviewed and re-arranged by N. Banks in Bulletin No. 15 of the technical series published by the Entomological Bureau of the U.S. Department of Agriculture, a work which, according to the author, was urgently needed. Africa is the true home of ticks, all the genera being represented on that continent, where species are likewise most numerous.

SOME time ago the Field Columbian Museum received an application from the President of Guatemala for advice concerning the possibility of introducing food-fishes from the United States into lakes Amatitlan and Atitlan. Mr. S. E. Meek was accordingly dispatched to Guatemala, and his report is now published by the museum as No. 6 of vol. vii. of the zoological series. It deals with the general zoology of the lakes, although devoting special attention to the fishes, and as our information with regard to the natural history of tropical lakes is very meagre, its interest is considerable.

ACCORDING to the report for 1907, the working of the Field Columbian Museum at Chicago has been rendered simpler and easier by the introduction of new regulations, which have now been in force for a twelvemonth. An important event of the year was the receipt of a sum of money to defray the expenses of an expedition about to be dispatched, where it is to remain for a period of three years. The report also includes an account of the results of a collecting expedition sent by the museum to British East Africa, the account being illustrated by photographs of a recently killed rhinoceros and giraffe. The latter evidently belongs to the race known as *Giraffa camelopardalis tippelskirchi*, although this is not mentioned on the plate.

THE mode of origin of new colonies of the South American sauba-ant (*Atta sexdens*) forms the subject of an article by Dr. J. Huber in vol. v., No. 1, of the *Boletim do Museu Goeldi* at Pará. As the result of recent observations, the statements of the older naturalists to the effect that a single fertilised female is capable of founding a colony by herself are proved to be true. The first batch of workers in the new colony appears to be developed within a minimum period of forty days. When these workers (the mode of alimentation of which is referred to in the paper) are fully developed, they forthwith commence the cultivation of the Rozites mycelium on leaves, the larvæ of the later broods being nourished on the "kohlrahi," or growths produced in the leaves by the presence of the fungus.

To the July number of the *Century Magazine* Mr. C. R. Stockyard contributes an interesting account of the fishery for spoon-beaked sturgeon (*Polyodon spatula*) in the lakes of the Mississippi region, together with notes on the habits of these huge fishes. The fishery is principally

carried on for the sake of the caviar yielded by these sturgeons, although the flesh, which is smoked and dried, also forms an important asset. These sturgeons attain a maximum weight of about 140 lb., with a length of nearly 6 feet, and in the case of a female yield some 16 lb. of roe. The average is, however, considerably below this, the yield of caviar being about 10 lb. Caviar is obtained from the roe by washing the eggs out of the membrane in which they are enveloped. The energy with which the fishery is carried on has greatly reduced the number of sturgeons in the lakes, where they do not breed, and plans for increasing the stock are under consideration. One of these fishes leaping out of the water in their characteristic fashion forms the subject of a full-page illustration.

IN the June number of the *Quarterly Journal of Microscopical Science*, Sir E. Ray Lankester states that a minute chlorophyllous organism, described by himself in 1885 as *Archerina boltoni*, is identical with the subsequently named *Golenkinia radiata*, and also with *Richteriella botryoides*, and he accordingly urges that the two last-mentioned names should give way to the one proposed by himself. Owing, apparently, to its frequent association with extraneous amœboid protoplasm, *Archerina* was referred by its describer to the Protozoa, whereas it now turns out to be a plant. Since names employed in zoology are not considered to preoccupy those used in botany (and *vice versa*), it remains to be seen whether the proposed change in nomenclature will be accepted by the botanists. In the same issue Prof. E. A. Minchin continues his account of the ascon-sponges, dealing in this instance specially with the mode of spicule-formation in the genus *Leucosolenia*, while Mr. C. L. Boulenger describes a new genus of hydromedusans from Lake Qurun, in the Fayum province of Egypt.

A SHORT paper on the development of flowers as influenced by the partial removal of roots and leaves is communicated by Mr. M. Shiga to the *Journal of the College of Science*, Tokio (vol. xxiii., article 4). The result of the few experiments recorded tends to show that moderate root-pruning hastens flowering, but leaf-removal is deleterious.

MR. H. PITTIER supplies a note on the Lecythidaceæ of Costa Rica to the series of Contributions from the United States National Herbarium (vol. xii., No. 2), in which two new species of *Eschweilera* and one of *Lecythis* are described and illustrated. These genera belong to the group that bear the characteristic "pyxidium" fruit. The seeds of the *Lecythis* are stated to have a finer flavour than the Brazil nut. The number also contains the diagnosis of a new apocynaceous genus, *Tonduzia*, by Mr. Pittier, and the identifications of a collection of Venezuelan plants by Mr. J. R. Johnston.

A PICTURESQUE narrative of the expedition undertaken by New Zealand men of science to the southern islands attached to the dominion occupies the first place in the latest instalment (No. 6) of the *Kew Bulletin*. Captain Dorrien Smith furnishes the biological account of the Auckland Isles. The striking vegetative features consist of a *Rata*, *Metrosideros lucida*, formation at the lower level; higher up, *Danthonia bromoides* forms large tussocks growing out of its own peat, and *Suttonia divaricatum* develops into a close scrub about waist high which can be traversed above, or under which the traveller may crawl. The occurrence of a tree fern, *Hemitelia Smithii*, in this southerly latitude testifies to the remarkable climate. Dr. Cockayne's account of the Snares Islands is also reproduced.

FROM the article communicated to the *Kew Bulletin* (No. 6) by Dr. O. Stapf, there is reason to expect that a rubber-yielding tree of Indo-China, *Bleekrodea tonkinensis*, which has been made the subject of special investigation and report, may prove to be more valuable than the various other recent discoveries in this direction. The tree was found in the forests of Tonkin, where, on a dry soil, it forms gregarious areas. It produces a latex fairly rich in caoutchouc that is best separated by treatment with sulphuric acid. The rubber, known in the vernacular as "teo-non," has been compared with Para. In connection with the rubber industry, the *Bulletin* contains a copy of a despatch from Mexico announcing that the supply of the plant yielding "Guayule" rubber is coming to an end, as reproduction is for practical purposes impossible owing to its slow growth.

THE first number of vol. vii. of *Abhandlungen der k.k. Geographischen Gesellschaft in Wien* contains a paper by Dr. Th. A. Ippen on the mountains of north-west Albania. After giving a general description of the mountain ranges, Dr. Ippen discusses in detail the valleys on the south side of the North Albanian Alps, commenting on the population and the means of communication in the Drin or Dukadschin mountains. Geographical details are given of the Fandi valleys and the Mirdita district, and the relation between the physical features and the industries of the inhabitants noticed. In a section dealing with the valley of the Mat, Dr. Ippen describes the Matja, Birschkasch, Uraka, and Kurbin districts, and discusses the customs and history of the inhabitants from evidence collected in the ruins of ancient villages. Further observations are still needed in the valleys of the Valbrona, Zmya, and Uraka, and in the district between Prizren and Djakova.

THE recent claim that the geysers in the Yellowstone Park are exhibiting signs of diminishing energy is discussed by Dr. Roland Dwight Grant in the *Bulletin* of the American Geographical Society for May. Changes observed in the colouring of the Minerva and Angel Terraces indicate that apparent diminutions of energy are due in reality to the diversion of the hot-water current to a new direction. The Excelsior Geyser is mentioned as an illustration of the many apparently dead geysers which have ceased to play on account of less clearly defined throats. Dr. Grant describes the Fountain and Black Growler geysers, which ceased to play owing to breaks in their pipes. He emphasises the fact, however, that in both cases the energy had merely been diverted to form new geysers, and that the current tended to return when the disturbing force ceased to act. The "mud volcano" is described, and the regularity of its action noticed. As a result of his observations in the Yellowstone Park, therefore, Dr. Grant is of opinion that the supposition of diminishing energy is unfounded.

WE have received the results of the magnetical and meteorological observations made at the Royal Alfred Observatory, Mauritius, in the year 1906. Having already referred to the report of the observatory for that year, we need only add that the results obtained from the self-registering instruments, the records of which are tabulated for each hour, and from eye observations, are very carefully worked out on the pattern of the Greenwich observations; monthly and annual rainfall at sixty-five stations are also given. The mean rainfall for the year over the whole island was 73.44 inches, as compared with the average 80.34 inches. Particulars are given of sixty-four earth movements shown by the photographic records of a Milne's seismograph during 1906.



THE report of the meteorological observations made at the Perth Observatory and other places in Western Australia in 1906 contains much useful information. The tables for Perth, which are given in great detail, include monthly mean values of the principal elements from 1876; monthly and yearly results are also given for some fifty stations, and rainfall at a large number of places, with averages for previous years. Mr. Cooke, the Government astronomer, remarks that the readings from the various localities may be considered trustworthy; some very high shade temperatures are recorded, e.g.  $116^{\circ}4$  at Eyre (January 22), and maxima exceeding  $100^{\circ}$  were recorded at the majority of stations. In previous years readings of  $117^{\circ}$  were observed at several places. The weather forecasts are very accurate; figures 1-5 are added to each forecast to indicate its degree of probability. Eliminating those stated at the time to be very doubtful, the success was 96 per cent.

IN the *Bulletin de la Société d'Encouragement* (vol. cx., No. 6) there is an interesting paper on the combat against fire-damp and carbonic oxide in collieries by Prof. N. Gréhant, in which illustrations are given of the fire-damp detector designed by the author. In the same issue Mr. S. Wologdine has a note on the heat-conductivity of refractory materials.

THE recent engineering and manufacturing development of Sweden has been rapid. With the opening of the railway through the rich iron-ore fields north of the Arctic circle and the extension of hydroelectric installations are now allied many important ship-canal and other projects, which are fully described in a profusely illustrated article by Mr. J. G. Leigh in the *Engineering Magazine* (vol. xxxv., No. 4). Another interesting article in the same number deals with the new processes for metal cutting and autogenous welding.

AT the installation of Dr. W. F. M. Goss as dean of the college of engineering of the University of Illinois, several interesting addresses were delivered, which are now published in a Bulletin (No. 21) of the University. The subjects dealt with were:—significant events in the development of the college of engineering, by Prof. Ira O. Baker; on the standing of the technical graduate in the engineering profession, by Mr. W. L. Abbott; on the State College of Engineering, by Prof. W. F. M. Goss; on the value of engineering research, by Mr. R. W. Hunt; and on the need of graduate courses in engineering, by Mr. Willard A. Smith.

A PAPER on rail corrugation, read by Prof. C. A. Carus-Wilson before the Tramway Congress on July 10, is reprinted in *Engineering*. The investigations outlined appear to show that the following conditions are necessary for the formation of corrugations on grooved rails:—(1) in the track (a) irregularities in gauge or level, (b) curvature, or (c) a packed groove; (2) a rail surface rough with sand or gritty dust; (3) wheels with check-cutting flanges; and (4) a critical speed. Corrugations cannot be formed unless conditions (1), (2), (3), and (4) are all present at the same time. These considerations suggest the lines on which it may be possible to avoid the formation of corrugations.

THE use of concrete and reinforced concrete pipe for culverts in railway embankments has suggested to Prof. A. N. Talbot an elaborate series of experiments, described in Bulletin No. 22 of the University of Illinois. The results throw light upon the resistance of pipe to embankment pressures, and also upon the action of sewers under similar

conditions. Cast-iron pipes, concrete pipes, and reinforced concrete pipes were tested. The specially prepared testing apparatus used included a box of strong and stiff construction, and the pipes were embedded in sand, and the load applied through a saddle which rested on a sand cushion. Auxiliary tests were made to connect the results of the investigation with the strength of the materials.

IN a paper on space and mathematical reasoning (*Mind*, xvii., 67, July), Mr. Leonard J. Russell discusses the theories of Poincaré and Russell, and puts forward a view of space on the analogy of number, empty space being found to have just such a significance as pure number has.

IN a note contributed to the *Rendiconti del R. Istituto Lombardo* (2), xli., 11, on problems and methods of metallography, Dr. Gaetano Maderna urges the importance of metallographic researches, and directs attention to the fact that this branch of study has been neglected in Italy, both by the Government and private firms.

PROF. FAUSTO MORINI contributes to the *Rendiconto* of the Bologna Academy a short note on a monstrosity in the fern *Aspidium lobatum*, var. *angulare*, Metten, found in the Apennines of the Bologna region. One of the lateral segments of the leaf is replaced by a very tiny leaflet devoid of sori, but possessing all the characteristics of an entire leaf, and the author considers that this monstrosity is due to the development of an adventitious gemma, the subsequent development of which has been limited to the formation of the leaflet in question.

IN the *Atti* of the Naples Academy of Physical and Mathematical Sciences, xiii. (1908), Prof. G. de Lorenzo discusses the origin of the volcanic craters of the Capo Miseno and the island of Nisida. The papers are illustrated by photographs, and the observations point to somewhat similar conclusions in both cases, namely, that the craters were caused by eruptions at first submarine in character, but ultimately rising into the air, and that the erosive action of air and water, and in particular of the sea, is accountable for the present configuration of the harbours in question.

Two papers dealing with considerations relating to statistics and probability have reached us. In the *Statistical Journal*, Prof. F. Y. Edgeworth (June 30) discusses the probable errors of frequency constants. The author alludes to the objections that have been raised to the use of the term "probable error," and examines the evidence for the existence of an index of credibility of this character from the consideration of a number of different problems. A recently issued number (*Studies in National Deterioration*, part iii.) of the Drapers' Company Research Memoirs contains a paper by the late Ernest G. Pope on marital infection in tuberculosis. While Prof. Karl Pearson in his editorial criticisms deviates in several points from the opinions expressed by Mr. Pope, it may be safe to infer from the statistics that the effect of infection on the coefficient of correlation is less than the effect which may be attributable to "assortative mating."

MR. J. W. GILTAY, of Delft, writes to say that the optical illusion, mentioned by Dr. Terada in *NATURE* of July 16 (p. 255), and also in the following issue (p. 277), reminds him of a similar effect noticed some weeks ago when witnessing a bicycle race at the velodrome at Scheveningen. "After having looked for some time at the racers, I casually looked at the spectators: the whole range of benches with the spectators appeared slowly to slide around, in a direction contrary to that moved in by the racers."

MESSRS. GEORGE BELL AND SONS have published a third edition of Mr. W. M. Baker's "Elementary Dynamics." Except that a number of minor corrections have been made, this edition appears not to differ from the second.

WE have received the forty-first volume, that for 1907, of the Journal and Proceedings of the Royal Society of New South Wales. The meetings of the society are reported from time to time in these columns under "Societies and Academies," and it is sufficient to direct attention to the publication of the annual volume.

### OUR ASTRONOMICAL COLUMN.

#### ASTRONOMICAL OCCURRENCES IN AUGUST:—

- Aug. 1. 11h. 28m. Minimum of Algol ( $\beta$  Persei).  
 4. 8h. 17m.  
 8. 6h. 41m. to 7h. 54m. "Moon occults 4 Sagittarii (mag. 4.6)."  
 9. 8h. 31m. Moon in conjunction with Uranus (Uranus  $0^{\circ} 24' N.$ ).  
 10-12. Maximum of the Perseid meteors (Radiant  $45^{\circ} + 57^{\circ}$ ).  
 11. 12h. Venus at greatest brilliancy.  
 14. 23h. 53m. Moon in conjunction with Saturn (Saturn  $2^{\circ} 46' N.$ ).  
 16. Saturn. Outer minor axis of outer ring =  $5''.84$ . Polar diameter of ball =  $17''.6$ .  
 18. Venus. Illuminated portion of disc =  $0.327$ .  
 24. 10h. 0m. Minimum of Algol ( $\beta$  Persei).  
 27. 0h. Vesta in conjunction with Moon (Vesta  $0^{\circ} 21' S.$ ).  
 31. 3h. Ceres in conjunction with Moon (Ceres  $0^{\circ} 31' N.$ ).

EARLY PERSEIDS.—Mr. Denning, at Bristol, observed the first traces of the great August meteor shower on July 21, but no signs of it were apparent during watches maintained over a part of the nights of July 18 and 19. On July 25 meteors were very rare in a beautifully clear sky, but on July 22 and 26 they were numerous, and supplied evidence of several active minor showers at  $298^{\circ}-15^{\circ}$ ,  $280^{\circ}+57^{\circ}$ , and  $303^{\circ}+24^{\circ}$ . On July 26 the Perseid display had assumed very decided prominence, for it furnished during the two hours preceding midnight about four meteors per hour within the sphere of vision commanded by a single observer. The radiant point appeared diffused over an area with centre at  $25^{\circ}+53^{\circ}$ , which agrees very nearly with the computed place of the shower centre on July 26.

A bright flashing Perseid, nearly equal to Jupiter, was recorded at 10h. 23m. on the night mentioned crossing the Milky Way in the south-west region of Aquila, the path being from  $287^{\circ}+3^{\circ}$  to  $278^{\circ}-11^{\circ}$ , where it left a bright streak for a few seconds. A bright star meteor from a southern radiant was seen at 11h. 33m. moving from  $350^{\circ}+6^{\circ}$  to  $17^{\circ}+20\frac{1}{2}^{\circ}$ , and at 11h. 49m. an Aquarid shot upwards close to  $\gamma$  Pegasi. A radiant at  $45^{\circ}+85^{\circ}$ , near Polaris, became well defined on the same night.

LARGE METEORS FROM SCORPIO.—In a letter to the July Observatory (p. 287, No. 398) Mr. Denning directs attention to the recent apparition of several large meteors coming from a radiant apparently situated in the constellation Scorpio. So far back as June 7, 1878, Mr. Denning's attention was directed to this radiant by the appearance of a large meteor, and since then he has regularly observed it, and has seen several very attractive meteors from it.

This year two fireballs from this radiant were observed, on May 19d. 10h. 20m. and May 22d. 8h. 50m. respectively, and duplicate observations show that the former passed over Ireland, from Ballyteigne Bay to co. Mayo, at a height of about sixty-nine to forty-five miles, along a path 142 miles in length; the radiant was in the region of  $252^{\circ}$ ,  $-22^{\circ}$ . Mr. Denning suggests that observations of this radiant in future years will amply repay the observers by providing them with brilliant meteoric phenomena at a season of the year when such phenomena are neither plentiful nor conspicuous. On the day of the partial solar eclipse, June 28, Mr. Denning saw a magnificent meteor, directed from Scorpio, which occupied seven seconds in

passing from  $276^{\circ}$ ,  $+23^{\circ}$ , to  $1^{\circ}$ ,  $+48\frac{1}{2}^{\circ}$ , and cast off a bright trail of yellow sparks.

THE RECENT NIGHT-GLOWS.—Several accounts of observations of the night-glows which were seen, about the beginning of the present month, by observers throughout mid-Europe appear in No. 4262 of the *Astronomische Nachrichten* (p. 239, July 16).

Prof. Weber, of Kiel University, reports that no marked, irregular oscillations of the magnets were registered, but from June 27-30 small regular oscillations of 2' amplitude and 3m. period were observed at intervals, and were not ascribable to any recognised cause.

Herr Köhl, of the Carina Observatory, Denmark, suggests that the solar illumination of cometary dust in the higher atmosphere might account for the phenomenon, and in this connection directs attention to the fact that several very large meteors were recently observed in Denmark.

Herr N. Donitsch states that on June 30 a fine aurora borealis was seen at Starya Doubossary, Bessarabia, and was visible from 11h. 10m. p.m. (local time) until dawn. The maximum illumination was a few degrees east of north, and suffered several variations; filaments, changing rapidly in form, were also seen.

DOUBLE-STAR MEASURES.—No. 4261 of the *Astronomische Nachrichten* contains further micrometer measures of double stars made by Prof. Burnham since the publication of his General Catalogue. The main idea of these observations is to establish beyond doubt the existence, or absence, of relative change of any kind in the lesser known and often neglected pairs. With this idea, the present list, as did the former, contains a note on each system indicating the nature and amount of any change which has been discovered.

THE HISTORY OF LUNAR RELIEF.—Charged with the task of bringing to completion the Loewy-Puiseux "Atlas photographique de la Lune," M. Puiseux is preparing the text which is to accompany the work. Whilst studying the photographs for this purpose, he has been struck by the peculiar formations surrounding the northern pole of our satellite, and finds in them and their structure a possible key to the history of lunar formations in general. These rectangular formations, prominent in the region of Anaxagoras, M. Puiseux concludes to be typical of the earlier types of lunar structure, since modified, in other latitudes, by subsequent action, and he shows in a note published in No. 2 of the *Comptes rendus* (p. 113, July 13) how they were probably formed by the contortions of the thin superficial crust. M. Puiseux does not, in the present note, discuss the reason why the period of structure-formation should be a function of latitude, but points out that in this respect the earth affords a parallel case.

### MINERALS, INCLUDING GEM-STONES, AT THE FRANCO-BRITISH EXHIBITION.

SCIENCE and commerce regard minerals from two very different points of view, and many of the specimens to which much prominence is given at the Franco-British Exhibition—such as, for instance, the ubiquitous masses of silver-bearing galena—would find no place in a purely mineralogical collection. Commerce is concerned only with the ore value of the specimens, and attaches no importance to the presence of crystals or to their form and symmetry. On the other hand, in a museum specimens are arranged by the most interesting or the best developed species displayed on them, and it is impossible to realise at a glance what precisely are the minerals found in some particular quarter of the globe. Thus collections that are representative of the mineral products of various countries cannot fail to be of interest, from whatever point of view they may be considered; moreover, here and there the mineralogist will note with appreciative eye a well-crystallised specimen.

Most of the minerals will be found at the far end of the extensive grounds in the spacious halls of the Dominion of Canada and the Commonwealth of Australia. In the former, a singularly tasteful hall, the collection of minerals is the property of the Government, and is permanently